

# Nonconforming Gender Expression and Associated Mental Distress and Substance Use Among High School Students

Richard Lowry, MD, MS; Michelle M. Johns, MPH, PhD; Allegra R. Gordon, ScD, MPH; S. Bryn Austin, ScD; Leah E. Robin, PhD; Laura K. Kann, PhD

**IMPORTANCE** The cultural roles and expectations attributed to individuals based on their sex often shape health behaviors and outcomes. Gender nonconformity (GNC) (ie, gender expression that differs from societal expectations for feminine or masculine appearance and behavior) is an underresearched area of adolescent health that is often linked to negative health outcomes.

**OBJECTIVE** To examine the associations of GNC with mental distress and substance use among high school students.

**DESIGN, SETTING, AND PARTICIPANTS** Cross-sectional study based on data from the Youth Risk Behavior Survey (YRBS) conducted in 2015. The setting was 3 large urban US school districts (2 in California and 1 in Florida). Participants were a racially/ethnically diverse population-based sample of 6082 high school students representative of all public school students in grades 9 through 12 attending these 3 school districts.

**MAIN OUTCOMES AND MEASURES** Sex-stratified adjusted prevalence ratios (APRs) (adjusted for race/ethnicity, grade, and sexual identity) for high gender-nonconforming students (very/mostly/somewhat feminine male students or very/mostly/somewhat masculine female students) and moderate gender-nonconforming students (equally feminine and masculine students) relative to a referent group of low gender-nonconforming students (very/mostly/somewhat masculine male students or very/mostly/somewhat feminine female students).

**RESULTS** Among 6082 high school students, 881 (15.9%) were white, 891 (19.1%) black, 3163 (55.1%) Hispanic, and 1008 (9.9%) other race/ethnicity. Among female students (2919 [50.0% of the study population]), moderate GNC was significantly associated with feeling sad and hopeless (APR, 1.22; 95% CI, 1.05-1.41), seriously considering attempting suicide (APR, 1.41; 95% CI, 1.14-1.74), and making a suicide plan (APR, 1.52; 95% CI, 1.22-1.89); however, substance use was not associated with GNC. Among male students (3139 [50.0% of the study population]), moderate GNC was associated with feeling sad and hopeless (APR, 1.55; 95% CI, 1.25-1.92); high GNC was associated with seriously considering attempting suicide (APR, 1.72; 95% CI, 1.16-2.56), making a suicide plan (APR, 1.79; 95% CI, 1.17-2.73), and attempting suicide (APR, 2.78; 95% CI, 1.75-4.40), as well as nonmedical use of prescription drugs (APR, 1.81; 95% CI, 1.23-2.67), cocaine use (APR, 2.84; 95% CI, 1.80-4.47), methamphetamine use (APR, 4.52; 95% CI, 2.68-7.61), heroin use (APR, 4.59; 95% CI, 2.48-8.47), and injection drug use (APR, 8.05; 95% CI, 4.41-14.70).

**CONCLUSIONS AND RELEVANCE** This study suggests mental distress is associated with GNC among female and male students. Substance use also appeared to be strongly associated with GNC among male students. These findings underscore and suggest the importance of implementing school-based programs to prevent substance use and promote student mental health that are inclusive of gender diversity in students.

JAMA Pediatr. doi:10.1001/jamapediatrics.2018.2140  
Published online September 24, 2018.

[+ Editorial](#)

[+ Supplemental content](#)

**Author Affiliations:** Author affiliations are listed at the end of this article.

**Corresponding Author:** Richard Lowry, MD, MS, Division of Adolescent and School Health, National Center for HIV/AIDS, Viral Hepatitis, Sexually Transmitted Disease (STD), and Tuberculosis (TB) Prevention, Centers for Disease Control and Prevention, 1600 Clifton Rd NE, Mail Stop E-75, Atlanta, GA 30329 (rlowry@cdc.gov).

**G**ender (ie, the cultural roles and expectations attributed to women and men based on their sex) often shapes health behaviors and outcomes. For example, research supports that masculinity in men predicts heavy alcohol use<sup>1</sup> and violence perpetration,<sup>2</sup> and adherence to feminine norms by women is linked to less use of condoms<sup>3</sup> and increased depression.<sup>4</sup> One aspect of gender increasingly linked to negative health outcomes is gender nonconformity (GNC). Gender nonconformity describes when an individual's gender expression does not align with societal expectations of their gender (Table 1).<sup>5,6</sup> Gender-nonconforming individuals often experience increased social stress resulting from exposure to prejudice, discrimination, harassment, and violence.<sup>5-8</sup> This appears to be especially true for adolescents; gender-nonconforming youths experience elevated rates of harassment and violence by peers,<sup>9,10</sup> as well as increased exposure to childhood abuse.<sup>11</sup>

Stigma, discrimination, harassment, and other social stressors have well-documented effects on health.<sup>12,13</sup> Research on racial/ethnic and sexuality-related health disparities points to the role of social and minority stress (or the repeated exposure to discrimination and harassment experienced by marginalized groups) as being particularly detrimental to mental health.<sup>14,15</sup> Discrimination has been linked to depression among black<sup>16,17</sup> and Latino<sup>18,19</sup> populations, as well as suicidality among sexual minority youths.<sup>20</sup> Exposure to bullying, harassment, and other social stressors also has been linked with elevated rates of substance use among both sexual minority and sexual nonminority youths.<sup>21</sup> In addition, gender minority youths report increased substance use and minority stress experiences.<sup>22</sup> The fact that gender-nonconforming adolescents experience discrimination,

## Key Points

**Question** What is the association between gender nonconformity (ie, gender expression that differs from societal expectations for feminine or masculine appearance and behavior) and indicators of mental distress and substance use among adolescents?

**Findings** In this cross-sectional study of 6082 high school students, gender nonconformity was associated with feeling sad and hopeless, as well as suicidal thoughts and/or behaviors, among female and male students. In addition, gender nonconformity was strongly associated with substance use among male students.

**Meaning** These findings underscore the importance of implementing school-based programs to prevent substance use and promote mental health that are inclusive of gender-diverse students.

harassment, and other forms of social stress at rates above and beyond those of gender-conforming youths<sup>8,9,11</sup> suggests that they may be at risk for poor mental health and substance use.

Evidence suggests that GNC may be linked to mental health and substance use disparities. Gender-nonconforming, sexual minority adults demonstrate elevated rates of psychological distress and anxiety compared with sexual minority adults who are gender conforming.<sup>8</sup> Gender nonconformity in sexual minority women has been associated with increased exposure to violence and minority stress, which in turn are associated with mental health problems and elevated rates of substance use, including increased use of alcohol, tobacco, and other drugs.<sup>23</sup> A few studies have evaluated the association between retrospective reports of childhood or adolescent GNC and mental health among young adults. Childhood GNC is associated with depressive symptoms in adolescence and young adulthood,<sup>24</sup> and adolescent GNC appears to be associated with both more depression and less life satisfaction during young adulthood.<sup>25</sup> Among adolescents, evidence suggests a link between GNC, homophobic bullying, and mental distress; however, gender-nonconforming boys experience more bullying and thus related mental distress than adolescent girls.<sup>26</sup> Another study<sup>27</sup> found tobacco use to be not only associated with high levels of self-rated masculinity in young men but also associated with childhood GNC, indicating that the association between substance use and GNC may not be linear.

Little is known about the associations between GNC, mental health, and substance use concurrently during adolescence. While it is clear that many lesbian, gay, bisexual, and transgender (LGBT) youths experience increased mental distress and substance use compared with heterosexual and cisgender youths, more information is needed about the associations of GNC with mental health and substance use among the general population of adolescents independent of sexual orientation. This information would enable practitioners to better understand the utility of considering the diversity of adolescent gender expression when designing mental health and substance use prevention programs for high school students. To address this gap, data from 3 racially/ethnically diverse population-based samples of US high school students from

**Table 1. Terminology Associated With Gender Diversity and Sexual Orientation**

Term	Definition <sup>a</sup>
Sex	An individual's biological status as male, female, or something else. Assigned at birth and associated with physical attributes, such as anatomy and chromosomes.
Gender	The cultural roles, behaviors, activities, and attributes expected of women and men based on their biological sex.
Gender expression	The manner in which an individual chooses to present their gender to others through physical appearance and behaviors, such as style of hair or dress, voice, or movement.
Gender identity	An individual's sense of their self as male, female, transgender, or something else.
Gender nonconformity	The state of one's physical appearance or behaviors not aligning with societal expectations of their gender. Gender-nonconforming physical appearance and behaviors may or may not align with individuals' gender identity.
Transgender	Individuals whose gender identity does not align with the sex they were assigned at birth.
Cisgender	Individuals whose gender identity aligns with the sex they were assigned at birth.
Gender minority	Individuals whose gender identity or gender expression does not align with the sex they were assigned at birth. Includes those who are transgender and gender nonconforming.
Sexual minority	Individuals who experience same-sex attraction or same-sex behavior or who identify as lesbian, gay, or bisexual.

<sup>a</sup> Definitions adapted from the American Psychological Association (APA). Definitions related to sexual orientation and gender diversity in APA documents (<https://www.apa.org/pi/lgbt/resources/sexuality-definitions.pdf>; published 2018; accessed April 2018).

3 large urban school districts were analyzed to describe the spectrum of gender expression, as well as the strengths of association between nonconforming gender expression (ie, GNC) and mental distress and substance use among students.

## Methods

### Study Design

As part of the Centers for Disease Control and Prevention's Youth Risk Behavior Surveillance System, approximately 20 large urban school districts conduct a Youth Risk Behavior Survey (YRBS) biennially using a 2-stage cluster sample design to produce a representative sample of high school students in grades 9 through 12 within each jurisdiction. In 2015, three large urban US school districts included an optional question on their YRBS questionnaire assessing gender expression among students. Data from these 3 school districts (2 in California and 1 in Florida) were combined into a single data set (6082 students). Questionnaires were administered in the classroom during a regular class period. Responses were recorded directly on computer-scannable answer sheets. Student participation in the survey was anonymous and voluntary, and local procedures were used to obtain parental consent. Each of these school districts reviewed and approved the YRBS using their local procedures. Overall response rates ranged between 70% and 90%, and sample sizes ranged between 1000 and 3000 students. The YRBS has been reviewed and approved by an institutional review board at the Centers for Disease Control and Prevention.

### Measures

Using a validated measure,<sup>28,29</sup> gender expression was assessed with the following statement and question: "A person's appearance, style, dress, or the way they walk or talk may affect how people describe them. How do you think people at school would describe you?" Response options were "very feminine," "mostly feminine," "somewhat feminine," "equally feminine and masculine," "somewhat masculine," "mostly masculine," and "very masculine." Based on a student's response to this and to the question "What is your sex?" (response options were "female" or "male"), a 7-point GNC scale was created. Students were categorized from most gender conforming (1, indicating very feminine female students and very masculine male students) to most gender nonconforming (7, indicating very masculine female students and very feminine male students) (eTable in the Supplement). Because there were small numbers of somewhat, mostly, or very masculine female students, the following 3-level GNC variable also was created: (1) high GNC (somewhat, mostly, and very masculine female students and somewhat, mostly, and very feminine male students), (2) moderate GNC (equally feminine and masculine female students and male students), and (3) low GNC (somewhat, mostly, and very feminine female students and somewhat, mostly, and very masculine male students). Sexual identity was assessed with the question "Which of the following best describes you?" Response options were "heterosexual (straight)," "lesbian or gay," "bisexual," and "not sure."

Demographic characteristics assessed included sex (female or male), race/ethnicity (non-Hispanic white, non-Hispanic black, Hispanic, or other), and grade (9, 10, 11, or 12). The YRBS also measures a wide range of substance use behaviors, from tobacco and alcohol use to heroin and injection drug use (IDU), as well as various indicators of mental distress, from feeling sad and hopeless to suicidal thoughts and/or attempts (Table 2). All questions used in this analysis were asked at all 3 sites with one exception: 1 of the 3 sites did not ask the question "During the past 12 months, did you make a plan about how you would attempt suicide?"

### Statistical Analysis

In 2017, data were analyzed using statistical software (SUDAAN, version 10.0.1; RTI International) to account for the cluster sample design. Prevalence estimates with 95% CIs were calculated using Taylor series linearization. Prevalence estimates were not provided in tables when there were fewer than 30 observations in the denominator. Differences in the distribution of GNC by demographic characteristics and sexual identity were tested using  $\chi^2$  statistics. Because gender expression varies by demographic characteristics and sexual orientation and because associations between GNC and other health risk behaviors tend to vary by sex, all associations of GNC with mental distress and substance use were stratified by sex and adjusted for race/ethnicity, grade, and sexual identity. In initial analyses of association, GNC was treated as a continuous variable ranging from 1 (most gender conforming) to 7 (most gender nonconforming); logistic regression models were used to examine both linear and nonlinear (quadratic) associations between GNC and mental distress and substance use. In subsequent categorical analyses, logistic regression models were used to calculate sex-stratified adjusted prevalence ratios (APRs) with 95% CIs that compared the prevalence of mental distress indicators and substance use among high gender-nonconforming students and moderate gender-nonconforming students relative to a referent group of low gender-nonconforming (ie, most gender conforming) students. Differences in the prevalence of mental distress and substance use between moderate and high gender-nonconforming students were tested by linear contrasts using *t* tests. Statistical tests were considered to be significant if 2-sided *P* < .05 or if the 95% CI did not include 1.0.

## Results

Among demographic characteristics, the weighted percentage (unweighted number) of students in the combined sample was 50.0% (95% CI, 47.9%-52.1%) (*n* = 2919) female and 50.0% (95% CI, 47.9%-52.1%) (*n* = 3139) male. Races/ethnicities were 15.9% (95% CI, 13.5%-18.7%) (*n* = 881) white non-Hispanic, 19.1% (95% CI, 16.6%-21.9%) (*n* = 891) black non-Hispanic, 55.1% (95% CI, 51.2%-58.8%) (*n* = 3163) Hispanic (of any race), and 9.9% (95% CI, 8.4%-11.7%) (*n* = 1008) other race/ethnicity. Grade levels were 28.5% (95% CI, 22.9%-34.9%) (*n* = 1581) in 9th grade, 25.0% (95% CI, 19.3%-31.7%) (*n* = 1662) in 10th grade, 23.5% (95% CI, 18.4%-29.6%) (*n* = 1438) in 11th

**Table 2. Youth Risk Behavior Survey (YRBS) Questionnaire Items and Analytic Coding in Selected US School Districts, 2015**

Behavior Assessed	YRBS Questionnaire Item	Analytic Coding
Gender expression	A person's appearance, style, dress, or the way they walk or talk may affect how people describe them. How do you think other people at school would describe you?	GNC scale: 1-7 <sup>a</sup>
Sex	What is your sex?	Female vs male
Mental distress		
Feeling sad/hopeless	During the past 12 months, did you ever feel so sad or hopeless almost every day for 2 weeks or more in a row that you stopped doing some usual activities?	Yes vs no
Seriously considered attempting suicide	During the past 12 months, did you ever seriously consider attempting suicide?	Yes vs no
Made a suicide plan <sup>b</sup>	During the past 12 months, did you make a plan about how you would attempt suicide?	Yes vs no
Attempted suicide	During the past 12 months, how many times did you actually attempt suicide?	≥1 vs 0
Substance use		
Cigarettes	During the past 30 days, on how many days did you smoke cigarettes?	≥1 vs 0
Alcohol	During the past 30 days, on how many days did you have at least one drink of alcohol?	≥1 vs 0
Marijuana	During the past 30 days, how many times did you use marijuana?	≥1 vs 0
Nonmedical use of prescription drugs	During your life, how many times have you taken a prescription drug (such as OxyContin, Percocet, Vicodin, codeine, Adderall, Ritalin, or Xanax) without a doctor's prescription?	≥1 vs 0
Cocaine	During your life, how many times have you used any form of cocaine, including powder, crack, or freebase?	≥1 vs 0
Methamphetamine	During your life, how many times have you used methamphetamine (also called speed, crystal, crank, or ice)?	≥1 vs 0
Heroin	During your life, how many times have you used heroin (also called smack, junk, or China White)?	≥1 vs 0
Injection drug use	During your life, how many times have you used a needle to inject any illegal drug into your body?	≥1 vs 0

<sup>a</sup> The Measures subsection of Methods contains more information on the gender nonconformity (GNC) scale construction; the GNC scale (range, 1-7) distribution of gender expression by sex and sexual identity is also available in the eTable in the Supplement.

<sup>b</sup> One of the 3 sites did not ask this question.

grade, and 22.9% (95% CI, 17.8%-28.9%) (n = 1322) in 12th grade. For sexual identity, 87.6% (95% CI, 86.4%-88.7%) (n = 5114) of students identified as heterosexual (straight), 2.5% (95% CI, 2.0%-3.2%) (n = 151) identified as lesbian or gay, 5.6% (95% CI, 4.8%-6.6%) (n = 350) identified as bisexual, and 4.3% (95% CI, 3.7%-5.0%) (n = 264) responded "not sure" to the sexual identity question.

Gender nonconformity varied by sex, race/ethnicity, grade, and sexual identity (Table 3). High GNC was more prevalent among male students (13.0%) than female students (4.0%); was more prevalent among lesbian or gay (41.7%), bisexual (15.7%), and "not sure" (14.3%) students than heterosexual students (6.4%); and decreased as grade level increased.

In initial analyses, GNC was treated as a continuous variable, and indicators of mental distress were strongly associated with GNC (Table 4). Among female and male students, feeling sad and hopeless demonstrated both a linear and quadratic association with GNC. While feelings of sadness and hopelessness increased with GNC, this increase was nonlinear, with the greatest prevalence of sadness and hopelessness occurring near the middle of the GNC scale. Suicidal thoughts also were associated with GNC. Among female and male students, both seriously considering attempting suicide and making a suicide plan demonstrated a linear increase with increasing GNC. Among male students (but not female students) suicide attempts also demonstrated a linear increase with GNC.

Substance use was associated with GNC among male students (but not female students) (Table 4). Among male students, the prevalence of nonmedical use of prescription drugs and the use of cocaine, methamphetamine, heroin, and injection drug use all demonstrated linear increases with increasing GNC. Among female students, no category of substance use was associated with GNC.

In categorical analyses, among female students, feelings of sadness and hopelessness (APR, 1.22; 95% CI, 1.05-1.41), seriously considering attempting suicide (APR, 1.41; 95% CI, 1.14-1.74), and making a suicide plan (APR, 1.52; 95% CI, 1.22-1.89) were more likely among students with moderate GNC compared with those with low GNC (Table 5). Among male students, feelings of sadness and hopelessness also were more likely among students with moderate (APR, 1.55; 95% CI, 1.25-1.92) rather than low GNC; however, seriously considering attempting suicide (APR, 1.72; 95% CI, 1.16-2.56), making a suicide plan (APR, 1.79; 95% CI, 1.17-2.73), and attempting suicide (APR, 2.78; 95% CI, 1.75-4.40) were more likely among students with high GNC than low GNC.

In categorical analyses, among female students, alcohol was the only substance for which use was associated with GNC; compared with students with moderate GNC, students with high GNC were more likely to drink alcohol (Table 5). Among male students, nonmedical use of prescription drugs (APR, 1.81; 95% CI, 1.23-2.67), cocaine use (APR, 2.84; 95% CI, 1.80-4.47), methamphetamine use (APR, 4.52; 95% CI, 2.68-7.61),



Table 3. Gender Nonconformity Among High School Students by Sex, Race/Ethnicity, Grade, and Sexual Identity in Selected US School Districts, 2015

Demographic Group	Gender Nonconformity, % (95% CI)			$\chi^2$ P Value
	Low <sup>a</sup>	Moderate <sup>b</sup>	High <sup>c</sup>	
Total population	79.7 (78.2-81.1)	11.9 (10.8-13.1)	8.4 (7.2-9.8)	NA
Sex				
Female	82.5 (80.7-84.2)	13.5 (12.1-15.0)	4.0 (3.2-4.9)	<.001
Male	76.8 (74.1-79.3)	10.2 (8.7-11.9)	13.0 (10.8-15.5)	
Race/ethnicity				
White	81.7 (77.7-85.1)	10.4 (7.9-13.5)	7.9 (5.8-10.7)	<.01
Black	79.7 (75.8-83.2)	9.1 (6.8-12.0)	11.2 (8.7-14.3)	
Hispanic	79.7 (77.7-81.5)	13.0 (11.4-14.7)	7.4 (6.0-9.1)	
Other	75.9 (72.4-79.0)	15.1 (12.3-18.3)	9.1 (6.8-12.0)	
Grade				
9	74.8 (71.8-77.6)	13.9 (11.6-16.7)	11.2 (9.2-13.7)	<.001
10	80.3 (77.2-83.1)	10.6 (8.4-13.4)	9.0 (7.0-11.5)	
11	80.9 (78.1-83.5)	11.4 (9.6-13.6)	7.6 (5.7-10.1)	
12	84.3 (80.0-87.8)	11.2 (8.0-15.4)	4.6 (3.4-6.1)	
Sexual identity				
Heterosexual	84.0 (82.6-85.4)	9.6 (8.4-11.0)	6.4 (5.4-7.5)	<.001
Lesbian/gay	37.0 (26.8-48.4)	21.3 (12.6-33.6)	41.7 (32.0-52.2)	
Bisexual	54.2 (48.1-60.3)	30.1 (24.9-35.7)	15.7 (11.4-21.2)	
Not sure	58.8 (50.2-66.8)	26.9 (20.0-35.2)	14.3 (9.6-20.8)	

Abbreviation: NA, not applicable.

<sup>a</sup> Female students who describe themselves as very/mostly/somewhat feminine; male students who describe themselves as very/mostly/somewhat masculine.

<sup>b</sup> Students who describe themselves as equally feminine and masculine.

<sup>c</sup> Female students who describe themselves as very/mostly/somewhat masculine; male students who describe themselves as very/mostly/somewhat feminine.

heroin use (APR, 4.59; 95% CI, 2.48-8.47), and IDU (APR, 8.05; 95% CI, 4.41-14.70) were more likely among students with high GNC compared with students with low GNC; IDU also was more likely among male students with moderate GNC compared with those with low GNC. Marijuana use (APR, 0.67; 95% CI, 0.48-0.95) was less likely among male students with moderate GNC than low GNC.

## Discussion

Within this study population, 1 in 5 students reported either moderate (11.9%) or high (8.4%) levels of GNC. Consistent with previous research,<sup>9,22,25,26</sup> the prevalence of GNC varied by demographic categories, including sex, race/ethnicity, grade, and sexual identity. In particular, a greater prevalence of high GNC was reported by lesbian or gay students (41.7%) and bisexual students (15.7%) compared with heterosexual students (6.4%). To our knowledge, this study is the first to examine associations of GNC with mental distress and substance use independent of associations with sexual identity among a racially/ethnically diverse population-based sample of high school students in 3 large urban US school districts.

As previous research<sup>26</sup> would suggest, while there were some similarities in the associations between GNC and mental distress among female and male students, there were differences as well. Feelings of sadness and hopelessness demonstrated a nonlinear increase with GNC among both female and male students. In categorical analyses, the greatest preva-

lence of feeling sad and hopeless was found among moderately gender-nonconforming female and male students. These findings may underscore unique challenges faced by students in the middle of the gender conformity spectrum. Although there is scant research on this group, youths experiencing moderate GNC may still experience significant distress related to experiences of discrimination and stigmatization.<sup>30</sup> In contrast, associations between GNC and suicidal thoughts and attempts varied by sex. Among female students, suicidal thoughts and plans (but not attempts) demonstrated a linear increase with GNC; in categorical analyses, the prevalence of suicidal thoughts and plans appeared to peak among moderately gender-nonconforming female students. Among male students, suicidal thoughts, plans, and attempts all demonstrated a linear increase with GNC; in categorical analyses, the greatest prevalence occurred among male students expressing high levels of GNC. These patterns may echo the sex differences in suicide reporting and suicidal behaviors observed in adolescents more broadly. In Western contexts, reported rates of suicide attempts are typically higher in girls and women, while suicide completions are typically higher in boys and men.<sup>31,32</sup> Female students reporting high GNC may be less (or no more) likely to report suicidal thoughts than more gender-conforming female students in part because of the association between masculinity and a reticence to report mental health symptoms. Conversely, male students reporting greater GNC may be more likely to disclose suicidal thoughts and attempts than male students who conform more strongly to conventional masculinity norms in part because they are not

**Table 4. Linear and Nonlinear Associations Between Gender Nonconformity and Health Risk Behaviors Among High School Students by Sex in Selected US School Districts, 2015<sup>a</sup>**

Health Risk Behavior	Gender Nonconformity Scale, %							Type of Association
	1 (Low) <sup>b</sup>	2 <sup>c</sup>	3 <sup>d</sup>	4 <sup>e</sup>	5 <sup>f</sup>	6 <sup>g</sup>	7 (High) <sup>h</sup>	
<b>Female Students</b>								
Mental distress in past 12 mo								
Feeling sad/hopeless	30.5	35.8	43.7	49.4	53.5	NA	NA	Linear and quadratic
Seriously considered attempting suicide	12.2	17.8	23.3	31.6	36.7	NA	NA	Linear only
Made a suicide plan	9.8	12.8	17.6	26.5	28.6	NA	NA	Linear only
Attempted suicide	7.4	10.6	11.8	14.9	23.5	NA	NA	None
Substance use								
Cigarettes in past 30 d	3.5	2.4	3.6	5.2	9.3	NA	NA	None
Alcohol in past 30 d	26.4	28.3	24.4	23.1	43.2	NA	NA	None
Marijuana in past 30 d	15.4	19.1	17.9	19.1	22.7	NA	NA	None
Nonmedical ever use of prescription drugs	9.1	10.1	9.2	12.4	11.4	NA	NA	None
Cocaine ever use	3.5	4.7	3.3	6.2	7.5	NA	NA	None
Methamphetamine ever use	1.9	1.8	2.6	3.4	8.1	NA	NA	None
Heroin ever use	1.2	1.1	1.8	0.8	6.0	NA	NA	None
Injection drug ever use	2.2	0.9	2.0	1.9	3.0	NA	NA	None
<b>Male Students</b>								
Mental distress in past 12 mo								
Feeling sad/hopeless	16.7	19.4	28.9	34.3	37.6	25.6	30.5	Linear and quadratic
Seriously considered attempting suicide	6.6	10.4	13.4	14.6	23.9	19.4	22.1	Linear only
Made a suicide plan	7.8	8.6	15.8	14.6	22.9	20.1	22.5	Linear only
Attempted suicide	4.6	3.4	6.1	9.3	26.4	17.7	14.7	Linear only
Substance use								
Cigarettes in past 30 d	4.8	6.0	7.5	5.1	13.3	5.2	7.6	None
Alcohol in past 30 d	23.1	26.1	22.8	19.9	19.0	15.9	20.9	None
Marijuana in past 30 d	21.7	22.0	20.0	14.0	23.2	15.0	18.8	None
Nonmedical ever use of prescription drugs	10.4	12.0	11.1	11.6	20.0	29.3	21.1	Linear only
Cocaine ever use	4.8	4.3	5.9	7.7	19.6	13.5	19.2	Linear only
Methamphetamine ever use	3.1	2.5	2.6	6.5	16.9	20.0	16.4	Linear only
Heroin ever use	2.5	1.3	0.8	3.1	16.2	14.3	14.0	Linear only
Injection drug ever use	1.6	0.2	1.3	3.2	10.3	18.4	10.5	Linear only

Abbreviation: NA, not applicable (prevalence estimates are not provided when there are <30 observations in the denominator).

<sup>a</sup> Type of association is identified based on statistical hypothesis tests of the corresponding linear and quadratic regression coefficients ( $P < .05$  by  $t$  test). Regression models are adjusted for race/ethnicity, grade, and sexual identity.

<sup>b</sup> Female students who describe themselves as very feminine; male students who describe themselves as very masculine.

<sup>c</sup> Female students who describe themselves as mostly feminine; male students who describe themselves as mostly masculine.

<sup>d</sup> Female students who describe themselves as somewhat feminine; male

students who describe themselves as somewhat masculine.

<sup>e</sup> Students who describe themselves as equally feminine and masculine.

<sup>f</sup> Female students who describe themselves as somewhat masculine; male students who describe themselves as somewhat feminine.

<sup>g</sup> Female students who describe themselves as mostly masculine; male students who describe themselves as mostly feminine.

<sup>h</sup> Female students who describe themselves as very masculine; male students who describe themselves as very feminine.

inhibited by masculine conventions that equate sharing mental distress with weakness.

Associations between GNC and substance use also varied by sex. Among female students, the prevalence of alcohol use was greater among high gender-nonconforming compared with moderate gender-nonconforming students; other categories of substance use did not vary by GNC. However, among male students, the prevalence of nonmedical use of prescription drugs, cocaine use, methamphetamine use, heroin use, and IDU each demonstrated a linear increase with GNC, with the greatest prevalence estimates found among high gender-

nonconforming male students. A recent study<sup>21</sup> of US high school students found that controlling for the increased social stress experienced by sexual minority youths reduced and in some cases eliminated the disparities in substance use by sexual orientation. This finding suggests that at least some of the increased substance use found among sexual minority youths may occur as a coping mechanism in response to experiences of social and minority stress.<sup>21</sup> If social stress has a similar role with respect to GNC, our findings are consistent with previous research suggesting that GNC may be met with more overt harassment of gender-nonconforming male youths

Table 5. APRs for Health Risk Behaviors Among High School Students by Sex and Gender Nonconformity in Selected US School Districts, 2015

Health Risk Behavior	Gender Nonconformity				
	Low <sup>a</sup>	Moderate <sup>b</sup>	APR (95% CI)	High <sup>c</sup>	APR (95% CI)
<b>Female Students</b>					
Mental distress in past 12 mo					
Feeling sad/hopeless	35.4	49.4	1.22 (1.05-1.41) <sup>d</sup>	44.8	1.04 (0.75-1.45)
Seriously considered attempting suicide	16.8	31.6	1.41 (1.14-1.74) <sup>d</sup>	31.8	1.34 (0.95-1.90)
Made a suicide plan	12.6	26.5	1.52 (1.22-1.89) <sup>d</sup>	22.8	1.31 (0.80-2.15)
Attempted suicide	9.7	14.9	1.14 (0.79-1.64)	20.5	1.60 (0.81-3.16)
Substance use					
Cigarettes in past 30 d	3.1	5.2	1.09 (0.54-2.20)	6.5	0.93 (0.40-2.19)
Alcohol in past 30 d	26.8	23.1	0.83 (0.66-1.05)	39.0	1.37 (0.94-2.02) <sup>e</sup>
Marijuana in past 30 d	17.5	19.1	1.11 (0.78-1.58)	27.6	1.53 (0.97-2.40)
Nonmedical ever use of prescription drugs	9.5	12.4	1.05 (0.65-1.70)	12.2	0.93 (0.45-1.92)
Cocaine ever use	4.0	6.2	1.12 (0.53-2.38)	7.5	1.18 (0.42-3.27)
Methamphetamine ever use	2.0	3.4	1.06 (0.43-2.61)	6.6	0.83 (0.23-3.02)
Heroin ever use	1.3	0.8	0.35 (0.10-1.21)	5.5	0.50 (0.10-2.45)
Injection drug ever use	1.6	1.9	0.69 (0.26-1.86)	1.7	0.62 (0.07-5.65)
<b>Male Students</b>					
Mental distress in past 12 mo					
Feeling sad/hopeless	19.9	34.3	1.55 (1.25-1.92) <sup>d</sup>	31.9	1.35 (0.97-1.88)
Seriously considered attempting suicide	9.4	14.6	1.17 (0.79-1.73)	22.0	1.72 (1.16-2.56) <sup>d</sup>
Made a suicide plan	9.5	14.6	1.21 (0.76-1.94)	22.0	1.79 (1.17-2.73) <sup>d</sup>
Attempted suicide	4.4	9.3	1.36 (0.74-2.53)	19.9	2.78 (1.75-4.40) <sup>d,e</sup>
Substance use					
Cigarettes in past 30 d	5.8	5.1	0.74 (0.40-1.34)	9.1	1.32 (0.79-2.20)
Alcohol in past 30 d	24.4	19.9	0.81 (0.59-1.11)	19.1	0.90 (0.62-1.31)
Marijuana in past 30 d	21.6	14.0	0.67 (0.48-0.95) <sup>d</sup>	19.5	0.83 (0.61-1.11)
Nonmedical ever use of prescription drugs	11.2	11.6	1.01 (0.66-1.57)	22.7	1.81 (1.23-2.67) <sup>d,e</sup>
Cocaine ever use	4.7	7.7	1.36 (0.74-2.49) <sup>d</sup>	18.0	2.84 (1.80-4.47) <sup>d,e</sup>
Methamphetamine ever use	2.8	6.5	1.89 (0.82-4.37)	17.5	4.52 (2.68-7.61) <sup>d,e</sup>
Heroin ever use	1.7	3.1	1.23 (0.55-2.72) <sup>d</sup>	14.8	4.59 (2.48-8.47) <sup>d,e</sup>
Injection drug ever use	1.0	3.2	2.62 (1.19-5.76) <sup>d</sup>	12.4	8.05 (4.41-14.70) <sup>d,e</sup>

Abbreviation: APR, adjusted prevalence ratio (adjusted for race/ethnicity, grade, and sexual identity, with low gender nonconformity being the referent group).

<sup>a</sup> Female students who describe themselves as very/mostly/somewhat feminine; male students who describe themselves as very/mostly/somewhat masculine.

<sup>b</sup> Students who describe themselves as equally feminine and masculine.

<sup>c</sup> Female students who describe themselves as very/mostly/somewhat masculine; male students who describe themselves as very/mostly/somewhat feminine.

<sup>d</sup> Different than low gender nonconformity students ( $P < .05$  or 95% CI does not include 1.0).

<sup>e</sup> Different than moderate gender nonconformity students ( $P < .05$ ).

compared with gender-nonconforming female youths.<sup>26,33,34</sup> Additional research is needed to better understand the links between gender norms, social stressors, and substance use behaviors across the spectrum of gender conformity. Also, given that transgender youths often have risk factors and experiences that overlap heavily with those of cisgender, gender-nonconforming youths, it is important to investigate whether associations of mental distress and substance use with self-reported transgender identity are similar to our findings with gender-nonconforming youths. Unfortunately, data on gender identity were not available in our study, and transgender students could not be identified. Finally, it is unknown whether our results would vary among a nationally representative population that would include both rural and suburban youths, as well as fewer racial/ethnic minority youths.

**Limitations**

Our study has some limitations. First, school-based YRBS data apply only to youths who attend school, and sexual minority and gender minority youths may be disproportionately represented among high school dropouts and other youths who are absent from or do not attend school.<sup>35</sup> Second, it is possible that students who are willing to report a stigmatized gender expression (ie, being gender nonconforming) may also be more willing to report stigmatized health behaviors and mental health symptoms, which could inflate observed estimates of the association between GNC and outcomes studied herein. Third, the extent of underreporting or overreporting of self-reported behaviors cannot be determined; however, the YRBS questionnaire items generally demonstrate good test-retest reliability.<sup>36</sup> Fourth, the data are cross-sectional and provide

only an indication of association, not causality. Furthermore, given the developmental context surrounding gender, our cross-sectional data do not allow us to examine how changes over time in either the individual's or greater culture's ideas about gender may affect the outcomes of interest. Fifth, small sample sizes at the most nonconforming end of the spectrum weakened our ability to examine associations across the full range of gender expression among female students.

## Conclusions

Developing support systems within schools for gender-nonconforming students may be an important avenue to improving mental health and reducing substance use in this population. Providing safe spaces and school staff contacts who are

knowledgeable and supportive of gender-nonconforming youths may also help to buffer stresses of the school environment. School staff may benefit from professional development on gender diversity to support students who are gender nonconforming more competently.<sup>37</sup> Health education that is inclusive of discussions about gender and the variety of ways that it is expressed may be useful to decrease stigma for gender-nonconforming youths.<sup>38,39</sup> In addition, given that verbal and physical harassment exacerbate both mental distress and substance use, instructing staff and students in bystander interventions may aid in improving the climate for gender-nonconforming youths. Based on previous research,<sup>40,41</sup> such interventions may have ripple effects in schools among sexual and gender minority youths: when students witness teachers and other students intervening on behalf of students being bullied, they in turn are more likely to intervene.

### ARTICLE INFORMATION

**Accepted for Publication:** May 30, 2018.

**Published Online:** September 24, 2018.

doi:10.1001/jamapediatrics.2018.2140

**Author Affiliations:** Division of Adolescent and School Health, National Center for HIV/AIDS, Viral Hepatitis, Sexually Transmitted Disease (STD), and Tuberculosis (TB) Prevention, Centers for Disease Control and Prevention, Atlanta, Georgia (Lowry, Johns, Robin, Kann); Division of Adolescent Medicine, Boston Children's Hospital, Boston, Massachusetts (Gordon, Austin); Department of Pediatrics, Harvard Medical School, Boston, Massachusetts (Gordon, Austin); Department of Social and Behavioral Sciences, Harvard T. H. Chan School of Public Health, Boston, Massachusetts (Austin).

**Author Contributions:** Dr Lowry had full access to all of the data in the study and takes responsibility for the integrity of the data and the accuracy of the data analysis.

**Concept and design:** All authors.

**Acquisition, analysis, or interpretation of data:** All authors.

**Drafting of the manuscript:** Lowry, Johns, Robin.

**Critical revision of the manuscript for important intellectual content:** All authors.

**Statistical analysis:** Lowry, Kann.

**Administrative, technical, or material support:** Gordon, Austin, Robin, Kann.

**Supervision:** Austin, Robin, Kann.

**Conflict of Interest Disclosures:** Dr Austin reported being supported by training grants T71-MC-00009 and T76-MC-00001 from the Maternal and Child Health Bureau, Health Resources and Services Administration, US Department of Health and Human Services. No other disclosures were reported.

**Disclaimer:** The findings and conclusions in this article are those of the authors and do not necessarily represent the official position of the Centers for Disease Control and Prevention.

### REFERENCES

1. Wells S, Flynn A, Tremblay PF, Dumas T, Miller P, Graham K. Linking masculinity to negative drinking consequences: the mediating roles of heavy episodic drinking and alcohol expectancies. *J Stud*

*Alcohol Drugs.* 2014;75(3):510-519. doi:10.15288/jasad.2014.75.510

2. Santana MC, Raj A, Decker MR, La Marche A, Silverman JG. Masculine gender roles associated with increased sexual risk and intimate partner violence perpetration among young adult men. *J Urban Health.* 2006;83(4):575-585. doi:10.1007/s11524-006-9061-6

3. Impett EA, Schooler D, Tolman DL. To be seen and not heard: femininity ideology and adolescent girls' sexual health. *Arch Sex Behav.* 2006;35(2):131-144. doi:10.1007/s10508-005-9016-0

4. Tolman DL, Impett EA, Tracy AJ. Looking good, sounding good: femininity ideology and adolescent girls' mental health. *Psychol Women Q.* 2006;30(1):85-95. doi:10.1111/j.1471-6402.2006.00265.x

5. Fenway Health. Glossary of gender and transgender terms. [http://fenwayhealth.org/documents/the-fenway-institute/handouts/Handout\\_7-C\\_Glossary\\_of\\_Gender\\_and\\_Transgender\\_Terms\\_fi.pdf](http://fenwayhealth.org/documents/the-fenway-institute/handouts/Handout_7-C_Glossary_of_Gender_and_Transgender_Terms_fi.pdf). Revised January 2010. Accessed November 23, 2017.

6. Institute of Medicine. *The Health of Lesbian, Gay, Bisexual, and Transgender People: Building a Foundation for Better Understanding*. Washington, DC: National Academies Press; 2011.

7. Gordon AR, Meyer IH. Gender nonconformity as a target of prejudice, discrimination, and violence against LGB individuals. *J LGBT Health Res.* 2007;3(3):55-71. doi:10.1080/15574090802093562

8. Puckett JA, Maroney MR, Levitt HM, Horne SG. Relations between gender expression, minority stress, and mental health in cisgender sexual minority women and men. *Psychol Sex Orientat Gen Divers.* 2016;3(4):489-498. doi:10.1037/sgd0000201

9. Gordon AR, Conron KJ, Calzo JP, Reisner SL, Bryn Austin S. Nonconforming gender expression is a predictor of bullying and violence victimization among high school students in four U.S. school districts. *J Adolesc Health.* 2016;58(2)(suppl):S1-S2. doi:10.1016/j.jadohealth.2015.10.019

10. Toomey RB, Card NA, Casper DM. Peers' perceptions of gender nonconformity: associations with overt and relational peer victimization and aggression in early adolescence. *J Early Adolesc.* 2014;34(4):463-485. doi:10.1177/0272431613495446

11. Roberts AL, Rosario M, Corliss HL, Koenen KC, Austin SB. Childhood gender nonconformity: a risk indicator for childhood abuse and posttraumatic stress in youth. *Pediatrics.* 2012;129(3):410-417. doi:10.1542/peds.2011-1804

12. Link BG, Phelan JC. Stigma and its public health implications. *Lancet.* 2006;367(9509):528-529. doi:10.1016/S0140-6736(06)68184-1

13. Pascoe EA, Smart Richman L. Perceived discrimination and health: a meta-analytic review. *Psychol Bull.* 2009;135(4):531-554. doi:10.1037/a0016059

14. Meyer IH, Frost DM. Minority stress and the health of sexual minorities. In: Patterson CJ, D'Augelli AR, eds. *Handbook of Psychology and Sexual Orientation*. New York, NY: Oxford University Press; 2013:252-266.

15. Williams DR, Yu Y, Jackson JS, Anderson NB. Racial differences in physical and mental health: socio-economic status, stress and discrimination. *J Health Psychol.* 1997;2(3):335-351. doi:10.1177/135910539700200305

16. Brown TN, Williams DR, Jackson JS, et al. Being black and feeling blue: the mental health consequences of racial discrimination. *Race Soc.* 2000;2(2):117-131. doi:10.1016/S1090-9524(00)00010-3

17. Schulz AJ, Gravlee CC, Williams DR, Israel BA, Mentz G, Rowe Z. Discrimination, symptoms of depression, and self-rated health among African American women in Detroit: results from a longitudinal analysis. *Am J Public Health.* 2006;96(7):1265-1270. doi:10.2105/AJPH.2005.064543

18. Ríos-Salas V, Larson A. Perceived discrimination, socioeconomic status, and mental health among Latino adolescents in US immigrant families. *Child Youth Serv Rev.* 2015;2015(56):116-125. doi:10.1016/j.childyouth.2015.07.011

19. Umaña-Taylor AJ, Updegraff KA. Latino adolescents' mental health: exploring the interrelations among discrimination, ethnic identity, cultural orientation, self-esteem, and depressive symptoms. *J Adolesc.* 2007;30(4):549-567. doi:10.1016/j.adolescence.2006.08.002

20. Haas AP, Eliason M, Mays VM, et al. Suicide and suicide risk in lesbian, gay, bisexual, and transgender populations: review and



- recommendations. *J Homosex*. 2011;58(1):10-51. doi:10.1080/00918369.2011.534038
21. Lowry R, Johns MM, Robin LE, Kann LK. Social stress and substance use disparities by sexual orientation among high school students. *Am J Prev Med*. 2017;53(4):547-558. doi:10.1016/j.amepre.2017.06.011
  22. Reisner SL, Greytak EA, Parsons JT, Ybarra ML. Gender minority social stress in adolescence: disparities in adolescent bullying and substance use by gender identity. *J Sex Res*. 2015;52(3):243-256. doi:10.1080/00224499.2014.886321
  23. Lehavot K, Simoni JM. The impact of minority stress on mental health and substance use among sexual minority women. *J Consult Clin Psychol*. 2011;79(2):159-170. doi:10.1037/a0022839
  24. Roberts AL, Rosario M, Slopen N, Calzo JP, Austin SB. Childhood gender nonconformity, bullying victimization, and depressive symptoms across adolescence and early adulthood: an 11-year longitudinal study. *J Am Acad Child Adolesc Psychiatry*. 2013;52(2):143-152. doi:10.1016/j.jaac.2012.11.006
  25. Toomey RB, Ryan C, Diaz RM, Card NA, Russell ST. Gender-nonconforming lesbian, gay, bisexual, and transgender youth: school victimization and young adult psychosocial adjustment. *Dev Psychol*. 2010;46(6):1580-1589. doi:10.1037/a0020705
  26. van Beusekom G, Baams L, Bos HM, Overbeek G, Sandfort TG. Gender nonconformity, homophobic peer victimization, and mental health: how same-sex attraction and biological sex matter. *J Sex Res*. 2016;53(1):98-108. doi:10.1080/00224499.2014.993462
  27. Pachankis JE, Westmaas JL, Dougherty LR. The influence of sexual orientation and masculinity on young men's tobacco smoking. *J Consult Clin Psychol*. 2011;79(2):142-152. doi:10.1037/a0022917
  28. Wylie SA, Corliss HL, Boulanger V, Prokop LA, Austin SB. Socially assigned gender nonconformity: a brief measure for use in surveillance and investigation of health disparities. *Sex Roles*. 2010;63(3-4):264-276. doi:10.1007/s11199-010-9798-y
  29. Greytak EA, Gill AM, Conron KJ. Identifying transgender and other gender minority respondents on population-based surveys: special considerations for adolescents. In: Herman JL, ed. *Best Practices for Asking Questions to Identify Transgender and Other Gender Minority Respondents on Population-Based Surveys*. Los Angeles, CA: Williams Institute; 2014:29-34.
  30. Richards C, Bouman WP, Seal L, Barker MJ, Nieder TO, T'Sjoen G. Non-binary or genderqueer genders. *Int Rev Psychiatry*. 2016;28(1):95-102. doi:10.3109/09540261.2015.1106446
  31. Canetto SS, Sakinofsky I. The gender paradox in suicide. *Suicide Life Threat Behav*. 1998;28(1):1-23.
  32. Rhodes AE, Boyle MH, Bridge JA, et al. Antecedents and sex/gender differences in youth suicidal behavior. *World J Psychiatry*. 2014;4(4):120-132. doi:10.5498/wjp.v4.i4.120
  33. Coyle EF, Fulcher M, Trübtschek D. Sissies, mama's boys, and tomboys: is children's gender nonconformity more acceptable when nonconforming traits are positive? *Arch Sex Behav*. 2016;45(7):1827-1838. doi:10.1007/s10508-016-0695-5
  34. Sirin SR, McCreary DR, Mahalik JR. Differential reactions to men and women's gender role transgressions: perceptions of social status, sexual orientation, and value dissimilarity. *J Men's Stud*. 2004;12(2):119-132. doi:10.3149/jms.1202.119
  35. Burton CM, Marshal MP, Chisolm DJ. School absenteeism and mental health among sexual minority youth and heterosexual youth. *J Sch Psychol*. 2014;52(1):37-47. doi:10.1016/j.jsp.2013.12.001
  36. Brener ND, Kann L, McManus T, Kinchen SA, Sundberg EC, Ross JG. Reliability of the 1999 Youth Risk Behavior Survey questionnaire. *J Adolesc Health*. 2002;31(4):336-342. doi:10.1016/S1054-139X(02)00339-7
  37. Case KA, Meier SC. Developing allies to transgender and gender-nonconforming youth: training for counselors and educators. *J LGBT Youth*. 2014;11(1):62-82. doi:10.1080/19361653.2014.840764
  38. Rands KE. Considering transgender people in education: a gender-complex approach. *J Teach Educ*. 2009;60(4):419-431. doi:10.1177/0022487109341475
  39. Centers for Disease Control and Prevention. Health Education Curriculum Analysis Tool (HECAT). <https://www.cdc.gov/healthyyouth/HECAT/index.htm>. Published 2012. Accessed April 2018.
  40. Wernick LJ, Kulick A, Inglehart MH. Influences of peers, teachers, and climate on students' willingness to intervene when witnessing anti-transgender harassment. *J Adolesc*. 2014;37(6):927-935. doi:10.1016/j.adolescence.2014.06.008
  41. Wernick LJ, Kulick A, Inglehart MH. Factors predicting student intervention when witnessing anti-LGBTQ harassment: the influence of peers, teachers, and climate. *Child Youth Serv Rev*. 2013;35(2):296-301. doi:10.1016/j.childyouth.2012.11.003